

WHAT IS CLAIMED IS:

1. A data transmission system including a resource holding main traffic, and a resource holding sub-traffic different from said main traffic, said data transmission system comprising:

a self-healing function of, when a failure related to said main traffic has occurred, detouring said main traffic to the resource of said sub-traffic to salvage said main traffic; and

a means for suppressing said self-healing function for a specific unit defined in the system.

2. The data transmission system according to claim 1, comprising:

a service line transmits said main traffic,

a protection line which is capable of transmitting sub-traffic different from said main traffic,

self-healing function control means for, when a failure related to said main traffic has occurred, carrying out a switching process which switches the transmission path of said main traffic to said protection line to detour said main traffic to said protection line; and

switching inhibit control means, when a segment sandwiched between adjacent pieces of node equipment is specified arbitrarily, inhibiting the main traffic set in the transmission path including the specified segment of said service line from being detoured to

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5. The data transmission system according to claim 4, wherein said switching inhibit control means inhibits the main traffic in said service line from

detouring to the resource on said protection line side corresponding to said specified transmission path.

6. The data transmission system according to claim 5, wherein,

5 when there is a transmission path for said sub-traffic in said protection line and the transmission path for said sub-traffic includes a resource on said protection line side corresponding to said specified transmission path,

10 said switching inhibit control means inhibits the main traffic in said service line from detouring to all of the resources in which the transmission path for said sub-traffic has been set.

15 7. The data transmission system according to claim 1, comprising:

 a service line transmits said main traffic,

 a protection line which is capable of transmitting sub-traffic different from said main traffic,

20 self-healing function control means for, when a failure related to said main traffic has occurred, carrying out a switching process which switches the transmission path of said main traffic to said protection line to detour said main traffic to said protection line; and

25 switching inhibit control means, when a resource serving as a unit of multiplexing in said service line is specified arbitrarily, inhibiting the main traffic

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set in the transmission path including the resource from being detoured to said protection line by said switching process at said self-healing function control means.

5 8. The data transmission system according to claim 7, wherein said switching inhibit control means inhibits the main traffic in said service line from detouring to a resource on said protection line side corresponding to said specified resource serving as a
10 unit of multiplexing.

 9. The data transmission system according to claim 1, comprising:

 a service line transmits said main traffic,
 a protection line which is capable of transmitting
15 sub-traffic different from said main traffic,

 self-healing function control means for, when a failure related to said main traffic has occurred, carrying out a switching process which switches the transmission path of said main traffic to said
20 protection line to detour said main traffic to said protection line; and

 switching inhibit control means, when a resource serving as the smallest unit in setting a transmission path in said service line is specified arbitrarily,
25 inhibiting the main traffic set in the transmission path including the resource from being detoured to said protection line by said switching process at said

self-healing function control means.

10. The data transmission system according to
claim 9, wherein said switching inhibit control means
inhibits the main traffic in said service line from
5 detouring to the resource on said protection line side
corresponding to said specified resource serving as the
smallest unit in setting a transmission path.

11. The data transmission system according to any
one of claim 2 to claim 10, further comprising means
10 for creating a transmission path with an attribute of
inhibiting the main traffic from being detoured to said
protection line by said switching process at said self-
healing function control means.

12. The data transmission system according to any
15 one of claim 2 to claim 10, further comprising means
for, when there is a transmission path in which the
main traffic is inhibited from being detoured to said
protection line by said switching process at said self-
healing function control means, canceling the
20 inhibition of the main traffic from detouring to the
transmission path.

13. The data transmission system according to any
one of claim 2 to claim 10, wherein,

when said service line and protection line are
25 both multiplex lines and transmission paths
concatenated over a plurality of adjacent multiplexing
units include said specified object,

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5 said switching inhibit control means inhibits the main traffic set in the concatenated transmission paths from being detoured to said protection line by said switching process at said self-healing function control means.

14. The data transmission system according to claim 1, comprising:

10 a service line transmits said main traffic,
a protection line which is capable of transmitting sub-traffic different from said main traffic,

15 self-healing function control means for, when a failure related to said main traffic has occurred, carrying out a switching process which switches the transmission path of said main traffic to said protection line to detour said main traffic to said protection line; and

20 switching inhibit control means for, when a resource in the system is specified arbitrarily, inhibiting the main traffic set in the resource from being detoured to said protection line by said switching process at said self-healing function control means, regardless of the presence or absence of a transmission path in the resource.

25 15. The data transmission system according to claim 14, wherein said switching inhibit control means inhibits the main traffic in said service line from detouring to said protection line of said specified

resource.

16. A network management equipment used in a data transmission system which connects a plurality of pieces of node equipment in a ring via a service line transmitting main traffic and a protection line capable of transmitting sub-traffic different from said main traffic and which includes self-healing function control means for, when a failure related to said main traffic has occurred, carrying out a switching process which switches the transmission path of said main traffic to said protection line to detour said main traffic to said protection line, said network management equipment comprising means for suppressing said self-healing function for a specific unit defined in the data transmission system.

17. The network management equipment according to claim 16, comprising:

specifying means for specifying arbitrarily a segment sandwiched between adjacent pieces of node equipment;

management information creating means for, when the specifying means has specified a segment, creating management information that the main traffic set in the transmission path including the specified segment of said service line is inhibited from being detoured to said protection line by said switching process at said self-healing function control means; and

management information setting means for sending a
set request message including said management
information created at the management information
creating means and setting said management information
5 in each of said plurality of pieces of node equipment.

18. The network management equipment according to
claim 17, wherein said management information creating
means causes said management information to include
information that the main traffic in said service line
10 is inhibited from detouring to said protection line in
said specified segment.

19. The network management equipment according to
claim 16, comprising:

specifying means for specifying arbitrarily a
15 transmission path set in said service line;

management information creating means for, when
the specifying means has specified a transmission path,
creating management information that the main traffic
set in the transmission path is inhibited from being
20 detoured to said protection line by said switching
process at said self-healing function control means;
and

management information setting means for sending a
set request message including said management
25 information created at the management information
creating means and setting said management information
in each of said plurality of pieces of node equipment.

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20. The network management equipment according to claim 19, wherein said management information creating means causes said management information to include information that the main traffic in said service line is inhibited from being detoured to the resource on said protection line side corresponding to said specified transmission path.

21. The network management equipment according to claim 20, wherein,

when a transmission path for said sub-traffic exists in said protection line and the transmission path for said sub-traffic includes the resource on the protection line side corresponding to said specified transmission path,

said management information creating means causes said management information to include information that the main traffic in said service line is inhibited from detouring to all the resources in which the transmission path for said sub-traffic has been set.

22. The network management equipment according to claim 16, comprising:

specifying means for specifying arbitrarily a resource serving as a unit of multiplexing in said service line;

management information creating means for, when the specifying means has specified a resource, creating management information that the main traffic set in the

transmission path including the resource is inhibited from being detoured to said protection line by said switching process at said self-healing function control means; and

5 management information setting means for sending a set request message including said management information created at the management information creating means and setting said management information in each of said plurality of pieces of node equipment.

10 23. The network management equipment according to claim 22, wherein said management information creating means causes said management information to include information that the main traffic in said service line is inhibited from detouring to the resource on said
15 protection line side corresponding to said specified resource serving as a unit of multiplexing.

24. The network management equipment according to claim 16, comprising:

20 specifying means for specifying arbitrarily a resource serving as the smallest unit in setting a transmission path in said service line;

25 management information creating means for, when the specifying means has specified a resource, creating management information that the main traffic set in the transmission path including the resource is inhibited from being detoured to said protection line by said switching process at said self-healing function control

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means; and

management information setting means for sending a
set request message including said management
information created at the management information
5 creating means and setting said management information
in each of said plurality of pieces of node equipment.

25. The network management equipment according to
claim 24, wherein said management information creating
means causes said management information to include
10 information that the main traffic in said service line
is inhibited from detouring to the resource on said
protection line side corresponding to said specified
resource serving as the smallest unit in setting a
transmission path.

26. The network management equipment according to
15 any one of claim 17 to claim 25, further comprising
path creating means for creating a transmission path
with an attribute of inhibiting the main traffic from
being detoured to said protection line by said
20 switching process at said self-healing function control
means.

27. The network management equipment according to
any one of claim 17 to claim 25, further comprising
canceling means for, when there is a transmission path
25 in which the main traffic is inhibited from being
detoured to said protection line by said switching
process at said self-healing function control means,

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canceling the inhibition of the main traffic from
detouring to the transmission path.

28. The network management equipment according to
any one of claim 17 to claim 25, wherein,

5 when said service line and protection line are
both multiplex lines and transmission paths
concatenated over a plurality of adjacent multiplexing
units include said specified object,

10 said management information creating means causes
said management information to include information that
the main traffic set in the concatenated transmission
paths is inhibited from being detoured to said
protection line by said switching process at said self-
healing function control means.

15 29. The network management equipment according to
any one of claim 17 to claim 28, further comprising
matching means for matching the management information
set in each of said plurality of pieces of node
equipment by said management information setting means
20 among the pieces of node equipment under the control of
at least the present network management equipment.

25 30. The network management equipment according to
claim 26, wherein said path creating means creates in
said protection line a transmission path with an
attribute of inhibiting the main traffic from being
detoured to its own transmission resource by said
switching process at said self-healing function control

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means.

31. The network management equipment according to claim 16, comprising:

specifying means for specifying a resource in the
5 system arbitrarily;

management information creating means for, when
the specifying means has specified a resource,
inhibiting the main traffic set in the transmission
path including the specified resource in said service
10 line from being detoured to said protection line by
said switching process at said self-healing function
control means, regardless of the presence or absence of
a transmission path in the resource; and

management information setting means for sending a
15 set request message including said management
information created at the management information
creating means and setting said management information
in each of said plurality of pieces of node equipment.

32. The network management equipment according to
20 claim 31, wherein said management information creating
means causes said management information to include
information that the main traffic in said service line
is inhibited from detouring to said protection line of
said specified resource.

33. A node equipment used in a data transmission
25 system which connects a plurality of pieces of node
equipment in a ring via a service line transmitting

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main traffic and a protection line capable of transmitting sub-traffic different from said main traffic and which includes self-healing function control means for, when a failure related to said main traffic has occurred, carrying out a switching process which switches the transmission path of said main traffic to said protection line to detour said main traffic to said protection line, said node equipment comprising means for suppressing said self-healing function for a specific unit defined in the data transmission system.

34. The node equipment according to claim 33, comprising:

self-healing function control means for, when a failure related to said main traffic has occurred, carrying out a switching process which switches the transmission path of said main traffic to said protection line to detour said main traffic to said protection line;

set request accepting means for specifying a segment sandwiched between adjacent pieces of node equipment and, when receiving a set request message including management information that the main traffic set in the transmission path including the specified segment of said service line is inhibited from being detoured to said protection line by said switching process at said self-healing function control means,

accepting the set request message, interpreting the management information included in the message, and creating management information to be set in the present piece of node equipment;

5 memory means for storing the management information created at the set request accepting means; and

 switching inhibit control means for partially inhibiting said switching process by said self-healing function control means on the basis of the management information stored in the memory means.

10 35. The node equipment according to claim 34, wherein said set request accepting means causes the management information to be set in said present piece of node equipment to include information that the main traffic in said service line is inhibited from detouring to said protection line in said specified segment.

15 36. The node equipment according to claim 33, comprising:

 self-healing function control means for, when a failure related to said main traffic has occurred, carrying out a switching process which switches the transmission path of said main traffic to said protection line to detour said main traffic to said protection line;

25 set request accepting means for specifying any one

of the transmission paths set in said service line and,
when receiving a set request message including
management information that the main traffic set in the
transmission path is inhibited from being detoured to
5 said protection line by said switching process at said
self-healing function control means, accepting the set
request message, interpreting the management
information included in the message, and creating
management information to be set in the present piece
10 of node equipment;

memory means for storing the management
information created at the set request accepting means;
and

switching inhibit control means for partially
15 inhibiting said switching process by said self-healing
function control means on the basis of the management
information stored in the memory means.

37. The node equipment according to claim 36,
wherein said set request accepting means causes the
20 management information to be set in said present piece
of node equipment to include information that the main
traffic in said service line is inhibited from
detouring to the resource on said protection line side
corresponding to said specified transmission path.

25 38. The node equipment according to claim 37,
wherein,

when a transmission path for said sub-traffic

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exists in said protection line and the transmission path for said sub-traffic includes the resource on the protection line side corresponding to said specified transmission path,

5 said set request accepting means causes said management information to be set in said present piece of node equipment to include information that the main traffic in said service line is inhibited from detouring to all the resources in which the
10 transmission path for said sub-traffic has been set.

39. The node equipment according to claim 33, comprising:

15 self-healing function control means for, when a failure related to said main traffic has occurred, carrying out a switching process which switches the transmission path of said main traffic to said protection line to detour said main traffic to said protection line;

20 set request accepting means for specifying any one of the resources serving as a unit of multiplexing in said service line and, when receiving a set request message including management information that the main traffic set in the transmission path including the
25 resource is inhibited from being detoured to said protection line by said switching process at said self-healing function control means, accepting the set request message, interpreting the management

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information included in the message, and creating management information to be set in the present piece of node equipment;

memory means for storing the management
5 information created at the set request accepting means;
and

switching inhibit control means for partially
inhibiting said switching process by said self-healing
function control means on the basis of the management
10 information stored in the memory means.

40. The node equipment according to claim 39,
wherein said set request accepting means causes the
management information to be set in said present piece
of node equipment to include information that the main
15 traffic in said service line is inhibited from
detouring to the resource on said protection line side
corresponding to said specified resource serving as a
unit of multiplexing.

41. The node equipment according to claim 33,
20 comprising:

self-healing function control means for, when a
failure related to said main traffic has occurred,
carrying out a switching process which switches the
transmission path of said main traffic to said
25 protection line to detour said main traffic to said
protection line;

set request accepting means for specifying any one

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of the resources serving as the smallest unit in
setting a transmission path in said service line and,
when receiving a set request message including
management information that the main traffic set in the
5 transmission path including the resource is inhibited
from being detoured to said protection line by said
switching process at said self-healing function control
means, accepting the set request message, interpreting
the management information included in the message, and
10 creating management information to be set in the
present piece of node equipment;

memory means for storing the management
information created at the set request accepting means;
and

15 switching inhibit control means for partially
inhibiting said switching process by said self-healing
function control means on the basis of the management
information stored in the memory means.

42. The node equipment according to claim 41,
20 wherein said set request accepting means causes the
management information to be set in said present piece
of node equipment to include information that the main
traffic in said service line is inhibited from
detouring to the resource on said protection line side
25 corresponding to said specified resource serving as the
smallest unit in setting a transmission path.

43. The node equipment according to claim 33,

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comprising:

self-healing function control means for, when a failure related to said main traffic has occurred, carrying out a switching process which switches the transmission path of said main traffic to said protection line to detour said main traffic to said protection line;

set request accepting means for specifying a resource in said data transmission system and, when receiving a set request message including management information that the main traffic set in the transmission path including the specified resource is inhibited from being detoured to said protection line by said switching process at said self-healing function control means, accepting the set request message, interpreting the management information included in the message, and creating management information to be set in the present piece of node equipment;

memory means for storing the management information created at the set request accepting means; and

switching inhibit control means for partially inhibiting said switching process by said self-healing function control means on the basis of the management information stored in the memory means.

44. The node equipment according to claim 43, wherein that said set request accepting means causes

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the management information to be set in said present
piece of node equipment to include information that the
main traffic in said service line is inhibited from
detouring to said protection line of said specified
resource.

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